

Method and mobile terminal for accessing a service portal via bi-directional network

The invention relates to a method of operating a mobile terminal comprising accessing a service portal via a bi-directional network. The invention relates also to 5 a mobile terminal comprising means for accessing a service portal via a bi-directional network. Another aspect of the invention relates to a method of operating a service portal, and yet another aspect relates to a service portal. A further aspect of the invention relates to a system comprising a service portal accessible via a bi-directional network by a mobile terminal. A still further aspect of 10 the invention relates to a method of operating a system comprising a service portal and a mobile terminal.

Much has been said recently about the provision in mobile terminals, for example mobile telephones, of the capability of receiving Internet protocol data casting 15 (IPDC) services, also known as IP time-sliced services. Convention is to provide an electronic service guide (ESG) in the mobile terminal, which is updated with ESG data transmitted over an IPDC network. The completed ESG present on a mobile terminal allows broadcast services to be accessed and consumed in the mobile terminal. However, this does not allow much flexibility as to the form that the ESG 20 may take, nor to how services are presented in a selectable manner to users of a mobile terminal.

A first aspect of the invention provides a method of operating a mobile terminal, the method comprising: accessing a service portal via a bi-directional network; 25 selecting an item on a service menu included in the service portal and corresponding to a broadcast service; receiving channel parameter data relating to the corresponding broadcast service from the service portal; using the received channel parameter data to open a communications channel; and receiving broadcast data for the broadcast service through the communications channel.

30 The service portal is in an embodiment a wireless application protocol (WAP), although it may instead take another suitable form. The channel parameter data preferably includes an Internet protocol (IP) address and/or port number relating to

the broadcast service, allowing the mobile terminal to receive and consume the required service relatively easily. The ease of reception and consumption can be improved by providing one or more of additional data such as, in case of DVB broadcast, INT, NIT and PMT data, which may be provided by the service portal or received over the broadcast network.

- According to a second aspect of the invention, there is provided a mobile terminal comprising: means for accessing a service portal via a bi-directional network; means for allowing selection of an item on a service menu included in the portal and corresponding to a broadcast service; means for receiving from the portal channel parameter data relating to the broadcast service; means for opening a communications channel using the channel parameter data; and means for receiving broadcast data for the broadcast service through the communications channel.
- According to a third aspect of the invention, there is provided a method of operating a service portal, the method comprising: storing data relating to channel parameters of one or more broadcast services; providing one or more selectable items on a service menu, each item relating to a broadcast service; and in response to the selection of an item from a remote terminal, sending channel parameter data relating to the corresponding broadcast service to the remote terminal.

Preferably, the method further comprises recording the number of occasions of each item being selected. This may or may not be carried out anonymously, i.e. identifying or not the mobile terminal or a subscriber using the mobile terminal along with the data. Either way, this can allow an operator of a mobile telephone network or other provider of the service portal to obtain data indicative of the relative usage of the broadcast services accessed through the service portal.

According to a fourth aspect of the invention, there is provided a service portal arranged: to store data relating to channel parameters of one or more broadcast services; to provide one or more selectable items on a service menu, each item relating to a broadcast service; and to be responsive to the selection of an item by a

remote terminal to send channel parameter data relating to the corresponding broadcast service to the remote terminal.

According to a fifth aspect of the invention, there is provided A system comprising  
5 a service portal accessible via a bi-directional network by a mobile terminal, the service portal being arranged to provide a service menu comprising one or more items each corresponding to a broadcast service; the mobile terminal being arranged for allowing selection of one of the items; the service portal being responsive to an item selection to send to the mobile terminal channel parameter information  
10 relating to the corresponding broadcast service; the mobile terminal being arranged to use the channel parameter information to open a communications channel, and to receive broadcast data for the broadcast service through the communications channel.

15 According to a sixth aspect of the invention, there is provided a method of operating a system comprising a service portal and a mobile terminal, the method comprising: accessing the service portal from the mobile terminal via a bi-directional network; providing a service menu comprising one or more items each corresponding to a broadcast service; using the mobile terminal to select one of the  
20 items; sending from the service portal to the mobile terminal channel parameter information relating to the broadcast service; at the mobile terminal, using the received channel parameter information to open a communications channel; and at the mobile terminal, receiving broadcast data for the broadcast service through the communications channel.

25 Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a schematic drawing illustrating one embodiment of a mobile terminal  
30 operating in an environment with a DVB system and a mobile telephone system; Figures 2 to 5 are schematic drawings illustrating exemplary screen shots of the mobile terminal of Figure 1 at varied stages in a service selection procedure;

Figure 6 is a flow diagram illustrating operation of the mobile terminal and a WAP portal forming part of the Figure 1 system in one embodiment of the invention; and Figures 7 and 8 are schematic drawings of alternative system configurations.

- 5 In the drawings, like reference numerals denote like elements. Referring firstly to Figure 1, a mobile terminal 10 is illustrated schematically comprising a display 11 and a keyboard 12. The mobile terminal 10 includes the functionality of a mobile telephone and the functionality of an Internet Protocol datacasting (IPDC) receiver. Much has been written about such mobile terminals in recent times, so it is not necessary to provide a detailed description here. The mobile telephone capabilities of the mobile terminal 10 can take any form. In this embodiment, the mobile terminal 10 is operable to communicate in a GSM or 3G network, although it may instead be operable in a network according to a US, Japanese or Korean standard or a standard applicable in any other part of the world. The mobile telephone operability may utilise orbiting satellites instead of ground based transceiver stations. The IPDC receiver means comprises at least one of a terrestrial digital video broadcasting (DVB-T) and/or a hand-held digital video broadcasting (DVB-H) receiver. Alternatively, it may be a receiver operating to the ATSC standard, or to any other digital audio or digital video broadcasting standard.
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- In this example, the mobile terminal 10 is operable to receive digital video broadcasting transmissions from a transmitter 13 and to communicate with a mobile telephone network by virtue of a bi-directional link with a base station 14. The DVB transmitter 13 and the base station 14 both are connected to an operator station 15. In this example, the operator station 15 is that of a combined mobile telephone network operator and IPDC service operator. The hardware and software components forming part of the operator station 15 are not critical to the invention, so are not described here.
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- 30 Shown in the operator system 15 are a WAP portal 16 and an IPDC services module 17. Both the WAP portal 16 and the IPDC services 17 are connected to receive data from an electronic service guide (ESG) data provision module 18, a service information (SI) data provision module 19 and an operator related data provision

module 20. The WAP portal 16 is in two-way communication with the base station 14, so that data may be passed in both directions therebetween. The IPDC services module 17 is operable to provide data unidirectionally to the DVB transmitter 13, for forwarding onto the mobile terminal 10 and any other terminal existing within 5 range of the transmitter.

The WAP portal 16 in this example comprises a service provision portal like that of T-zones (TM) or Vodafone live! (TM). The WAP portal 16 is operable to provide one or more service menus, preferably in a hierachal fashion. Each service menu 10 comprises a number of links to either a further service menu lower down in the hierarchy or to a resource providing an end service.

The IPDC services module 17 provides a full digital broadcast service, comprising a number of services transmitted in a time-sliced fashion. In addition to content, the 15 IPDC services module 17 arranges for the appropriate transmission of ESG data, SI data and other operator or services related data, which is provided by the ESG data module 18, the SI data module 19 and the operator related data module 20 respectively. It is preferred that ESG data and SI data is included with sufficient frequency and in such a manner that a mobile terminal, such as the mobile terminal 20 10, can perform ESG discovery in a relatively short time and with relatively high efficiency.

In a first embodiment, the WAP portal 16 is arranged to include data provided by the ESG data module 18, the SI data module 19 and the operator related data 25 module 20. In particular, the WAP portal 16 is provided with, in respect of each IPDC service which the WAP portal 16 is to offer, the name of the service, the Internet Protocol (IP) address of the service and the port number of the service. Furthermore, the data includes the network information table (NIT), the IP/MAC 30 notification table (INT), and the program mapping table (PMT) data. The NIT, INT and PMT data may be provided additionally as part of the ESG data. The remainder of the ESG data can be ignored by the WAP portal if inappropriate, or alternatively used by the WAP portal or forwarded onto the mobile terminal 10.

In a second embodiment, the WAP portal 16 is not provided with all of the data with which the WAP portal of the first embodiment is provided. Instead, the WAP portal 16 is provided only with data indicative of the name of the service, the IP address of the service and the port number. In this case, the INT, the NIT and the 5 PMT SI data is provided to the mobile terminal 10 through the DVB network by way of the transmitter 13. This is described in more detail below.

Operation of the first embodiment is now continued with reference to Figures 2 to 6. In Figure 2, a service menu, or page, of a WAP portal of the mobile telephone 10 operator is illustrated. The first service menu is known as the 'main page'. Here, on the display 11 are illustrated first to sixth icons 20a to 20f, which are "new", "messages", "chat", "download", "games", and "more..." respectively. Also shown at the top of the display 11 is the name of the WAP portal, in this case Vodafone live! (TM), and shown at the bottom of the display 11 are functions of first and 15 second soft keys (not shown), which in this example are "select" and "back".

Following selection by a user of the sixth icon 20f "more..." through the keypad 12, the display 11 is altered to that shown in Figure 3. Here, the name of the service menu is provided at the top of the display 11, and the functions of soft keys are shown at the bottom of the display 11. Also, first to sixth items 30a to 30f are 20 illustrated. The third item 30c is "sport", which when selected by user using the keypad 12 or other selecting means (not shown) provided in the terminal causes the mobile terminal 10 to show the display illustrated in Figure 4.

In Figure 4, the uppermost section of the display 11 shows the name of the service 25 menu, which in this case is "sport". A number of services available in this service menu are listed as first to fifth items 40a to 40e. In this example, the second item 40b relates to 'football', and it is illustrated as part of the item that a live match between Brazil and Germany currently forms the basis of an IPDC service being transmitted by the DVB transmitter 13. When the second item 40b is selected by a 30 user, the mobile terminal 10 begins to receive the service, as illustrated in Figure 5.

Items in the service menus relating to IPDC services are shown in the same way as other items, or in a very similar way. In the example shown, the fact that the

second item 40b relates to an IPDC service is illustrated by some smaller text to the right side of the larger text which gives the name of the item in the service menu.

A number of steps are carried out in the background between the selection of the 5 second item 40b of Figure 4 and the consumption of the IPDC service relating thereto, as will now be described with reference to Figure 6.

Figure 6 is a schematic flow diagram illustrating certain operations of the mobile terminal 10 and the WAP portal 16. The process begins at step S60, with the 10 mobile terminal 10 requesting a WAP page which relates to the WAP portal 16 of the mobile network operator. The request transmitted at step 60 includes an identification of the mobile terminal and/or the user/subscriber of the terminal. This identification may comprise the International Mobile Subscriber Identity (IMSI), data indicating the make and model, and possibly also the software release 15 number of the mobile terminal 10, the IPDC terminal identifier, or any other suitable identification and/or characterisation. The exact form of the data is not necessary, so is not described in detail here. This request is received at the WAP portal 16 at step S61. Following this step, the service menu is provided at step S62. This involves the transmission from the base station 14 of pushed data allowing the 20 service menu illustrated in Figure 2 to be presented on the display 11 of the mobile terminal 10. The service menu is then displayed at the mobile terminal at step S63. The user then may navigate through the service menu and service menus falling below it in the hierarchy by way of user input S64. When the user selects an item forming part of a service menu which relates to an IPDC service, instead of another 25 service menu or a non-IPDC service, data indicating the selection is transmitted from the mobile terminal at S65. The item selection data is received at the WAP portal 16 at step S66. In response, the WAP portal 16 obtains the channel parameter information relating to the service which corresponds to the selected item at step S67. In the first embodiment, this channel parameter information is the 30 name of the service, the IP address and the port number, which is sent at step S68 and received at step S69 at the mobile terminal 10. At step S70, the mobile terminal obtains SI data relating to the selected service. In the first embodiment, the SI data is transmitted from the WAP portal 16 at step S71. This SI data includes the INT,

the NIT and the PMT SI data mentioned above. In the second embodiment, the step S70 involves obtaining SI data by listening to broadcasts from the DVB transmitter 13. It will be appreciated that it will in most cases be impractical to wait until the channel parameter information is received at step S69 before obtaining the 5 SI data. Instead, the mobile terminal 10 is arranged to monitor periodically transmissions from the DVB transmitter 13 and to maintain in a memory (not shown) up-to-date ESG and SI data. In this case, the obtaining SI data step S70 involves reading the stored SI data from the memory (not shown) included in the mobile terminal 10.

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In both the first and second embodiments, the mobile terminal, having received the channel parameter information and obtained the SI data at steps S69 and S70, opens an IP channel using the received information at step S72. The mobile terminal can then receive and consume the IPDC service at step S73.

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The opening of the IP channel step S72 will be appreciated to include opening the required IP port, and optionally filters forming part of the mobile terminal 10.

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The step S68 may also comprise sending data identifying an application which is needed to consume the selected IPDC service. In this case, the mobile terminal 10 is responsive to the data to open, i.e. run the software comprising, the application. Alternatively, the mobile terminal 10 could determine from the received service data what application is needed.

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Optionally, the WAP portal 16 includes an additional step S74, in which the selection of the IPDC service by the mobile terminal 10 is recorded. This step S74 is interposed between the step of receiving the selection at S66 and the step S67 of obtaining the channel parameter information. The recording of the information at step S74 allows the gathering of information identifying the number of mobile terminals which request the different IPDC services available through the WAP 30 portal 16. This information can be of use to the mobile network operator, since it can allow it to tailor the IPDC services provided through its WAP portal 16 to make more prominent popular services and to make less prominent, or even omit entirely,

services which are not popular or which are not used. If the mobile terminal 10 accesses a service directly from the DVB transmitter 13 without involving the WAP portal 16, the mobile network operator is unable to obtain information about service usage without the user of the mobile terminal voluntarily providing the 5 information.

Preferably, the step of recording user selections at S74 is performed anonymously, i.e. the WAP portal 16 does not record information identifying the mobile terminal 10 or the subscriber using the mobile terminal when noting what IPDC services 10 have been accessed through the WAP portal.

An advantage of the first embodiment described above is that the mobile terminal 10 does not need to listen to broadcasts from the DVB transmitter 13 before receiving a service, as would normally be the case. Instead, all of the information 15 needed to access the required service is available through the WAP portal 16. This can reduce the time required to access the service, and may also provide reduced battery power consumption.

An additional optional step is carried out in the WAP portal 16, namely the step of 20 personalising the service menu. This is illustrated at step S75. Step S75 involves analysing the terminal/subscriber identification and characterisation information transmitted from the mobile terminal at step S60. Only IPDC services which are suitable for the mobile terminal are included in the service menu at step S62. A service is not suitable if, for example, the mobile terminal 10 does not have the 25 capability of consuming the service. This may be, for example, because it is not provided with the software application which is needed to consume the data, or perhaps because it is not provided with appropriate output transducers. For example, the display 11 of the mobile terminal 10 may not have a suitable resolution 30 for consumption of certain services, or it may be that the mobile terminal does not have appropriate audio output facilities, for example stereophonic audio reproduction capability. The information that the WAP portal 16 needs to determine whether or not the mobile terminal 10 is capable of consuming the data

relating to a service forms part of the ESG data and the SI data provided by the ESG data module 18 and the SI data module 19 respectively.

5       The personalising step S75 may also include determining from data identifying the subscriber IPDC services which the subscriber is not authorised to access. This may occur if, for example, a subscriber is roaming in a foreign network.

10      Personalisation occurs on each generation of a service menu for the mobile terminal 10. In particular, the main page shown in a display screen of a mobile terminal has 10 a service menu personalised to take account of the particulars of the mobile terminal 10 or the subscriber using the mobile terminal, and service menus generated at positions further down the hierarchy from the main page also are personalised to take account of this.

15      Instead of not including inappropriate items on a service menu, they may be included but distinguished from the other items, for example by being displayed in a different colour. A user would then know that the corresponding services are not fully accessible using the mobile terminal 10. Each such item preferably is provided by the WAP portal 16 such that selecting it results in redirection to a WAP page (or 20 other information provision service) giving instructions on how to access the corresponding service. This information may be instructions to download an appropriate software application, to buy a suitable terminal, or perhaps may include directions for accessing the service in a different way, for example using the world wide web or a television receiver.

25      In a further embodiment, again described with reference to Figure 6, the personalisation of service menus is not performed prior to the provision of service menu step S62. Instead, if the WAP portal 16 receives at step S66 data selecting an IPDC service which is unsuitable for the mobile terminal (either because the mobile 30 terminal 10 does not have the capability to consume the service or because it is not authorised to receive the service), the user is redirected to a personalised service menu page. Here, data is pushed to the mobile terminal 10 to provide a service menu which lists only services that the mobile terminal is capable of consuming

and/or is authorised to receive. The WAP portal 16 provides on this service menu only services which are similar to the IPDC service selected at step S65. The personalised service menu provided following redirection may also include text indicating that redirection has been effected, in order to inform the user.

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A further embodiment will now be described with reference to Figure 7. In Figure 7, the mobile terminal 10 is operable to receive signals broadcast by a DVB transmitter 13, as in Figure 1. However, an IPDC operator 80 is separated from a mobile network 81. The IPDC operator 80 and the operator of the mobile network 10 81 may or may not be the same entity, and may or may not be present at different locations. In the embodiment of Figure 7, the data provided by the ESG data module 18, the SI data module 19 and the operator related data module 20 are provided to the mobile telephone network 81 via the Internet 82 by the IPDC operator. Alternatively, the Internet 82 could be replaced by any other suitable 15 communications channel. The mobile network 81 preferably is arranged to request up-to-date information from the IPDC operator 80 as and when required, for example a predetermined time before data stored in the mobile network is due to expire. However, any other suitable scheme could be used instead.

20 In this example, the WAP portal 16 is shown as forming part of the mobile telephone network 81, which will typically be the case when the user of the mobile terminal 10 wishes to access the service menu of his or her mobile telephone network operator. The WAP portal 16 may be located at any convenient location within the mobile network 81. In this example, the ESG data module 18, the SI 25 data module 19 and the operator related data module 20 form part of the IPDC operator 80, although not shown in Figure 7.

A further example will now be described with reference to Figure 8. Here, the WAP portal 16 does not form part of the mobile telephone network. Instead, it is 30 connected to the IPDC operator 80 and the mobile network 81 by the Internet 82. Alternatively, a different communication channel could be utilised, or a separate communication channel utilised for each of the separate connections. The WAP portal 16 is provided with ESG data, SI data and operator related data from the

IPDC operator 80 in any suitable manner. The main difference here is that when the mobile terminal 10 requires data from the WAP portal 16, the request for data is routed through the mobile network 81 and the Internet 82 to the WAP portal 16. Similarly, data pushed from the WAP portal 16 to the mobile terminal 10 passes 5 through the Internet 82 and the mobile network 81.

Allowing access to IPDC services through the WAP portal 16, with or without providing SI data, has the advantage that it allows users to access IPDC services through a familiar user interface. Suitable construction of the service menus in the 10 WAP portal 16 can allow all of the appropriate IDPC services to be provided to the user of the mobile terminal 10 through the WAP portal 16, thereby allowing the user to avoid DVB ESG usage if required.

The above-described embodiments are illustrative only, and are not intended to be 15 limiting on the scope of protection afforded. Any feature specified as being preferable or optional is not essential, but instead may be omitted entirely or replaced by another feature. Anything which is said 'may' be included or 'may' have some characteristic also is preferable, and could be omitted or instead replaced with another feature or characteristic. The scope of protection is to be limited only by 20 the accompanying claims and their equivalents.